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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/632,960	08/04/2003	Katsuki Nagahashi	60188-570	4471

7590 01/03/2006

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EXAMINER
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SIDDIQUI, SAQIB JAVAID

ART UNIT	PAPER NUMBER
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2138

DATE MAILED: 01/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. 10/632,960	Applicant(s) NAGAHASHI ET AL.	
	Examiner Saqib J. Siddiqui	Art Unit 2138	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/12/04 &amp; 08/04/03</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Priority***

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in Application No. 10/6322960, filed on August 04, 2003. Priority date of August 28, 2002 has been assigned.

### ***Oath/Declaration***

The Oath filed August 04, 2003 complies with all the requirements set forth in MPEP 602 and therefore is accepted.

### ***Drawings***

The filed drawings are accepted.

### ***Specification***

The contents of the filed specification are accepted.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claim 1 is rejected under 112.1 as being unpatentable for being a single means claim. See MPEP 2164.08(a).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada et al. US Pat no. 5,920,574.

As per claim 1:

Shimada et al. substantially teaches an accelerated test method (column 2, lines 44-45) for evaluating, under accelerated conditions (a temperature  $T_2$  and a voltage  $V_2$ ), an endurance characteristic of a ferroelectric memory device comprising a capacitor element (column 3, lines 50-53) having a ferroelectric film under actual operating conditions (a temperature  $T_1$  and a voltage  $V_1$ ), the method comprising the step of: deriving an acceleration factor (K).

Shimada et al. does not explicitly teach the exact same equation for the acceleration factor, which is  $\log K = A (1/V_1 - 1/V_2) + B (1/V_1 T_1 - 1/V_2 T_2)$ .

However, Shimada et al. discloses a similar equation to derive the acceleration factor:  $K = \exp(Ea/kx(1/T1-1/T2))$  (column 5, line 10). Here  $k$  is the constant and  $E$  is the activation energy. It is known in the art that energy stored in a capacitor can be denoted as  $E = 1/2 CV^2$ , where  $C$  is the capacitance (which is a constant) and  $V$  is the voltage. Hence if we apply this known equation with the equation disclosed by Shimada et al. and apply the log function to get rid of the exponential we will get the following equation:  $\log K = (CV^2)/2kx(1/T1-1/T2)$ . It would have been obvious to anyone skilled in the art to derive the equation, as disclosed by the applicant, from the above equation since it is just the manipulation of mathematics. Further this derivation would have been obvious since one with ordinary skill in the art would have realized that it would be better to express the acceleration factor in Voltage and Capacitance as opposed to energy, since these are quantities that can be obtained more easily in the laboratory equipment as opposed to calculating energy.

As per claim 2:

Shimada et al. substantially teaches an accelerated test method (column 2, lines 44-45) for evaluating, under accelerated conditions (a temperature  $T_2$  and a voltage  $V_2$ ), an endurance characteristic of a ferroelectric memory device comprising a capacitor element (column 3, lines 50-53) having a ferroelectric film under actual operating conditions (a temperature  $T_1$  and a voltage  $V_1$ ), the method comprising the step of: deriving an acceleration factor ( $K$ ), the method further comprising the step of: determining the constants  $A$  and  $B$  by measuring polarization-inversion-voltage dependence of a remanence (column 3, line 57-67) of the ferroelectric film which varies

with increase of the number of occurrences of polarization inversion in the ferroelectric film at each of a plurality of temperatures (column 4, line 34-36).

Shimada et al. does not explicitly teach the exact same equation for the acceleration factor, which is  $\log K = A (1/V_1 - 1/V_2) + B (1/V_1 T_1 - 1/V_2 T_2)$ .

However, Shimada et al. discloses a similar equation to derive the acceleration factor:  $K = \exp (Ea/kx (1/T_1 - 1/T_2))$  (column 5, line 10). Here  $k$  is the constant and  $E$  is the activation energy. It is known in the art that energy stored in a capacitor can be denoted as  $E = 1/2 CV^2$ , where  $C$  is the capacitance (which is a constant) and  $V$  is the voltage. Hence if we apply this known equation with the equation disclosed by Shimada et al. and apply the log function to get rid of the exponential we will get the following equation:  $\log K = (CV^2)/2kx (1/T_1 - 1/T_2)$ . It would have been obvious to anyone skilled in the art to derive the equation, as disclosed by the applicant, from the above equation since it is just the manipulation of mathematics. Further this derivation would have been obvious since one with ordinary skill in the art would have realized that it would be better to express the acceleration factor in Voltage and Capacitance as opposed to energy, since these are quantities that can be obtained more easily in the laboratory equipment as opposed to calculating energy.

**Claim 3** is allowable but is pending due to its dependency on claim 1.

#### ***Related Art***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Additional pertinent prior arts, US Pat no. 5929475 A and US Pat


no. 6727156 B2 mention the same test method using a ferroelectric memory and determining the endurance of the memory are included herein for Applicant's review.

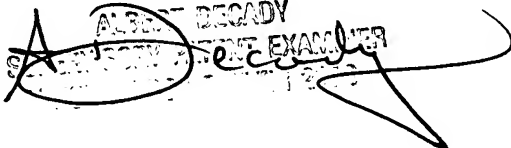
### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saqib J. Siddiqui whose telephone number is (571) 272-6553. The examiner can normally be reached on 8:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Saqib Siddiqui  
Art Unit 2138  
12/22/2005

  
ALBERT DECADY  
SUPERVISOR